

CLAIMS:

1. A superconducting ceramic of the general formula  
 $(A_{1-x}B_x)_y Cu_z O_w$  (i)

in which  $0.1 \leq x < 1$

$$y = 2.0-4.0$$

$$z = 1.0-4.0$$

$$w = 4.0-10.0$$

A is one or more rare earth elements and

B is more than one alkaline earth element  
 when A is one rare earth element, and is one  
 or more alkaline earth elements when A is  
 more than one rare earth element.

2. A superconducting ceramic according to claim 1, in  
 which

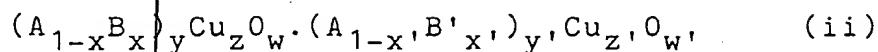
$$y = 2.5-3.5$$

$$z = 1.5-3.5 \text{ and}$$

$$w = 6.0-8.0.$$

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3. A superconducting ceramic according to claim 1 of the general formula



in which  $0.1 \leq x < 1$

$$0.1 \leq x' < 1$$

$$y = 2.0-4.0,$$

$$y' = 2.0-4.0,$$

$$z = 1.0-4.0,$$

$$z' = 1.0-4.0,$$

$$w = 4.0-10.0,$$

$$w' = 4.0-10.0,$$

A is one or more rare earth elements and

B and B' are two or more alkaline earth elements.

4. A superconducting ceramic according to claim 3, in which

$$y = 2.5-3.5$$

$$y' = 2.5-3.5$$

$$z = 1.5-3.5$$

$$z' = 1.5-3.5$$

$$w = 6.0-8.0 \text{ and}$$

$$w' = 6.0-8.0.$$

5. A superconducting ceramic according to claim 3 ~~or claim 4~~, in which A is one rare earth element.

6. A superconducting ceramic according to claim 5, having the stoichiometric formula  $\text{YbBaSrCu}_3\text{O}_{6-8}$ .

5 7. A superconducting ceramic according to claim 5, having the stoichiometric formula  $\text{YBaCaCu}_3\text{O}_{6-8}$ .

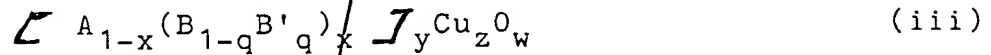
8. A superconducting ceramic according to claim 5, having the stoichiometric formula  
10  $\text{YbBa}_{0.7}\text{Sr}_{0.6}\text{Ca}_{0.6}\text{Cu}_3\text{O}_{6-8}$ .

9. A superconducting ceramic according to claim 3 ~~or claim 4~~, in which A is more than one rare earth element.

10. A superconducting ceramic according to claim 9,  
15 having the stoichiometric formula  
 $\text{Y}_{0.5}\text{Yb}_{0.5}\text{BaSrCu}_3\text{O}_{6-8}$ .

11. A superconducting ceramic according to claim 9, having the stoichiometric formula  
 $\text{Y}_{0.5}\text{Yb}_{0.5}\text{BaCaCu}_3\text{O}_{6-8}$ .

12. A superconducting ceramic according to claim 1, of the general formula



in which  $0.1 \leq x < 1$

5  $0 < q < 1$

$y = 2.0-4.0,$

$z = 1.0-4.0,$

$w = 4.0-10.0,$

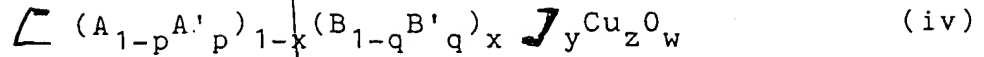
A is a rare earth element and

10 B and B' are different alkaline earth elements.

13. A superconducting ceramic according to claim 12, in which

15  $y = 2.5-3.5$   
 $z = 1.5-3.5$  and  
 $w = 6.0-8.0.$

14. A superconducting ceramic according to claim 1, of the general formula



in which  $0.1 \leq x < 1$

$$0 < p < 1$$

$$0 < q < 1$$

$$y = 2.0-4.0,$$

$$z = 1.0-4.0,$$

$$w = 4.0-10.0,$$

A and A' are different rare earth elements

and

B and B' are different alkaline earth ele-

ments.

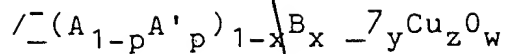
15. A superconducting ceramic according to claim 14,  
in which

$$y = 2.5-3.5$$

$$z = 1.5-3.5$$

$$w = 6.0-8.0.$$

16. A superconducting ceramic according to claim 1, of  
the general formula



(v)

in which

$$0.1 \leq x < 1$$

$$0 < p < 1$$

5

$$y = 2.0-4.0,$$

$$z = 1.0-4.0,$$

$$w = 4.0-10.0,$$

A and A' are different rare earth elements

and

10

B is an alkaline earth element.

~~17. A superconducting ceramic according to claim 16,~~

in which

$$y = 2.5-3.5$$

$$z = 1.5-3.5$$

15

$$w = 6.0-8.0.$$

18. A superconducting ceramic according to claim ~~16~~<sup>16</sup>,  
having the stoichiometric formula  $Y_{0.5}Gd_{0.5}Ba_2Cu_3O_{6-8}$ .

19. A superconducting ceramic according to claim ~~17~~<sup>16</sup>,  
having the stoichiometric formula  $Y_{0.5}Yb_{0.5}Ba_2Cu_3O_{6-8}$ .

20. A method for producing a superconducting ceramic  
according to any one of claims 1 to 19, which comprises

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a. 4

mixing together stoichiometric amounts of the oxides and/or carbides of the constituent metals, in powder form, compressing the mixture to a desired shape and sintering the mixture at an elevated temperature.

- 5 21. A superconducting ceramic comprising two or more rare earth elements and/or two or more alkaline earth elements and having a polycrystalline perovskite-like structure of large crystalline particles providing reduced interfacial areas between crystalline particles and correspondingly elevated superconducting onset  
10 temperature.